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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
TOOMER, CEPHIA D	

ART UNIT	PAPER NUMBER
1714	

DATE MAILED: 10/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/757,849	FINKELSHTAIN ET AL.	
	Examiner	Art Unit	
	Matthew A. Thexton	1714	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 September 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *70-99,111-117 and 119-139* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *98,117 and 131* is/are allowed.

6)☒ Claim(s) *70-97,99,101-116,119-130 and 132-139* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Text of Title 35 USC not Cited

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims Version

The listing of claims submitted 2006 September 29 has been examined.

Claims Analysis

Claims 1-69, 100, and 118 have been canceled.

New claim 139 has been added.

Claims 70-99, 101-117, and 119-139 are pending.

Independent claim 70 is directed to processes "for preparing a metal hydride containing liquid for use as a fuel in a direct liquid fuel cell" comprising: combining:

(a) a concentrate comprising:

(i) at least one metal hydride;

(ii) a polar solvent; and

(iii) hydroxide ion concentration of at least about 7 moles per liter;

wherein after 4 weeks at about 25C not more than about 2% of the at least one metal hydride compound(s) in the concentrate have decomposed; and

(b) a solvent in an amount of at least about 15 volume % of the concentrate.

Claims 71-83 depend directly or indirectly from claim 70 and specify or further limit: the resulting hydroxide ion concentration; the amount of decomposition; the amount of hydride in the concentrate; the amount of hydroxide in the concentrate; the type of hydride; the type of hydroxide compound; the type of solvent; the presence of water; the relative amounts of hydroxide and hydride in the concentrate, "concentrate is substantially free of any additives which adversely affect the stability of the at least one metal hydride compound;" "concentrate is substantially free of plasticizers, detergents and antifreeze;" and "concentrate is substantially free of any stabilizer for the at least one metal hydride compound which is different from a hydroxide ion providing compound."

Independent claim 84 is directed to processes "for producing a packaged combination for making a fuel for use with a direct liquid fuel cell," wherein the fuel comprises:

(i) at least one metal hydride compound;

(ii) a polar solvent; and

(iii) a hydroxide ion concentration of not higher than about 7 moles per liter;

comprising:

(a) providing a container having at least a first and second compartments;

(b) partially or completely filling the first with a concentrate comprising:

(i) at least one metal hydride compound;

(ii) a first portion of a polar solvent; and

(iii) at least about 8 moles per liter of hydroxide ion;

(c) partially or completely filling the at least one second compartment with an amount of polar solvent which in combination with the concentrate will afford the fuel.

Claims 85-99 depend directly or indirectly from claim 84 and specify or further limit: the fuel hydroxide ion concentration; the amount of decomposition; the amount of hydride in the concentrate; the type of hydride; the type of hydroxide compound; the type of solvent; the presence of water; the fuel hydride concentration; "concentrate is substantially free of any additives which adversely affect the stability of the at least one metal hydride compound;" "concentrate is substantially free of plasticizers, detergents and antifreeze;" "concentrate is substantially free of any stabilizer for the at least one metal hydride compound which is different from a hydroxide ion providing compound;" at least one additive in the second compartment; the type of additive; and the container allows mixing of the compartments components inside it.

Independent claim 101 is directed to container for providing a fuel for use with a direct liquid fuel cell, the fuel comprises:

(i) at least one metal hydride compound;

(ii) a polar solvent; and

(iii) a hydroxide ion concentration of not higher than about 7 moles per liter;

comprising:

(a) a first compartment containing a concentrate comprising:

(i) at least one metal hydride compound;

(ii) a polar solvent; and

(iii) a hydroxide ion concentration higher than the hydroxide ion concentration of the fuel; and

(b) at least one second compartment containing a solvent;

wherein the combining the contents of the compartments produces the fuel.

Claims 102-117 depend directly or indirectly from claim 101 and specify or further limit: the container is sealed and allows mixing of the compartments' contents before discharging; the presence of "instructions;" the compartments do not surround each other; the at least partial surrounding of one compartment by another; the amount of hydride in the concentrate; the type of hydride; the type of hydroxide compound; the type of solvent; the presence of water; the concentration of hydride in the fuel; "concentrate is substantially free of any additives which adversely affect the stability of the at least one metal hydride compound;" "concentrate is substantially free of any stabilizer for the at least one metal hydride compound which is different from a hydroxide ion providing compound;" at least one additive in the second compartment; the type of additive; and the type of hydride stabilizer in the second compartment.

Claim 139 depends from claim 101 and is directed to a "process for filling a liquid fuel cell, wherein the process comprises using the container of claim 101 as a filling device for the fuel cell."

Independent claim 119 is directed to packaged combination "for providing a fuel for use with a direct liquid fuel cell" comprising:

(a) a first container containing a concentrate comprising:

(i) at least one metal hydride compound;

(ii) a polar solvent; and

(iii) a hydroxide ion concentration higher than the hydroxide ion concentration of the fuel; and

(b) at least one second container containing a solvent in an amount sufficient to result in the fuel if the solvent if the contents of the first and at least one second container are combined.

Claims 120-131 depend directly or indirectly from claim 119 and specify or further limit: the presence of "instructions;" the concentration of hydride in the concentrate; the amount of decomposition; the type of hydride; the type of hydroxide compound; the presence of water; the concentration of hydride in the fuel; "concentrate is substantially free of any additives which adversely affect the stability of the at least one metal hydride compound;" "concentrate is substantially free of plasticizers, detergents and antifreeze;" "concentrate is substantially free of any stabilizer for the at least one metal hydride compound which is different from a hydroxide ion providing compound;" at least one

additive selected from plasticizers, detergents and antifreeze in the second container; and the type of hydride stabilizer in the second container.

Independent claim 132 is directed to "method of reducing the decomposition of a fuel for a direct liquid fuel cell during storage of the fuel comprising:

(a) storing the fuel as a concentrate, said concentrate comprising:

(i) at least one metal hydride compound;

(ii) a polar solvent; and

(iii) a hydroxide ion providing ion; and

(b) diluting the concentrate to prepare the fuel only before using the fuel in the fuel cell;

wherein after 4 weeks at about 25C not more than about 2% of the at least one metal hydride compound(s) in the concentrate have decomposed.

Claims 133 and 134 depend directly or indirectly from claim 132 and specify or further limit: the type of hydride; and the concentration of hydride in the concentrate.

Independent claim 135 is directed to a container "for making a fuel for use with a direct liquid fuel cell" comprising:

(a) a first compartment containing a concentrate comprising:

(i) at least one metal hydride compound;

(ii) a polar solvent; and

(iii) a hydroxide ion concentration higher than the hydroxide ion concentration of the fuel; and

(b) at least one second compartment containing a solvent in an amount sufficient to result in the fuel if the solvent if the contents of the first and at least one second container are combined;

wherein after 4 weeks at about 25C not more than about 2% of the at least one metal hydride compound(s) in the concentrate have decomposed.

Claims 135-138 depend directly or indirectly from claim 135 and specify or further limit: the concentration of hydride in the concentrate; and the concentration of the hydride in the combination.

Claim Rejections - 35 USC § 112

Claims 75, 88-90, 108, 109, and 123 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The recited compound "$(CH_3)_3NBH_3$" does not appear to have basis in the originally filed specification, including the claims. Although Applicant offers a reasoned basis for the indicated subject matter (page 22 of response of 2006 September 29), this is not found persuasive for the following reason. Reference '640 recites a similar list of hydrides (e.g., [0035]) in which the neutral formula "$(CH_3)_2NHBH_3$" is employed. Applicant has

not offered any rationale for now reciting the compound presented, which is conflicting with '640.

Claims Rejections

Claims 70-83 and 132-134 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Finkelshtain et al. (US 2002/0083640A1) alone or in view of Amendola et al. (US 2002/0083643 A1) and further in view of evidentiary reference Pecsok (1953).

The present claims are broadly discussed hereinabove in the section ***Claims Analysis*** which is incorporated by reference.

The reference '640 discloses fuel mixtures for fuel cells comprising "a surface active compound" and hydride such a $NaBH_4$ and an electrolyte such as KOH. The concentration of KOH may be 2 to 12 M (paragraph 0040, and claim 10). It is stated the hydride solutions are unstable in acid or neutral conditions but stable in basic (paragraphs 0017 to 0020). It would be immediately envisaged by one of ordinary skill in the art at the time of the invention to create the basic solution to obtain the stability noted. '640 further notes that 6M KOH is the preferred concentration, although stability and solubility are factors to take into account for exact composition of the fuel (paragraph 0040), hence it would be immediately envisaged that the disclosed stability objective is a function of basicity and mere dilution to 6M would obtain the noted preference, as required by claims 70-83 and 132-134. In sum, '640 suggests employing basic solutions for stability, and suggests employing 6M hydroxide ions for optimal

electrical output; one of ordinary skill in the art would realize that dilution of a storage stable solution of pH>7 is the way to accomplish both goals. Pecsok (1953) discloses that the stability of the aqueous sodium borohydride solution increases with increasing pH (as effected by employing greater amounts of sodium hydroxide).

In the event the reference is deemed to be of not sufficient specificity to sustain a conclusion of anticipation, such as the hydroxide concentration of claims 70-83, then it is concluded that it would have been obvious to one of ordinary skill in the art at the time of the invention to have varied the degree of basicity as suggested ("pH above 7" [0023]) to obtain a desired level of stability, knowing that stability is a function of basicity (Pecsok (1953)), whether storing it in the laboratory or in commerce, it would be apparent that longer storage is desirable and obtainable by the expedient suggested. Accordingly, having obtained the obvious concentrate for storage property, it would have been obvious to one of ordinary skill in the art at the time of the invention to dilute for use, as it is suggested to employ 6M concentration ([0040]), as required by claims 70-83 and 132-134. To the extent that the claims require a pH not suggested by the reference, '643 suggests that higher pH is more effective ([0033]), as well as suggests starting with a concentrated solution and adding water during use ([0032] at the last 2-4 lines of page 2), thus it is concluded that one of ordinary skill in the art at the time of the invention would have found it obvious to employ workable pH while keeping in mind the intention of diluting and the desired generating output, balancing the various factors.

Claims 84-97, 99, 101-116, 119-130, and 135-139 are rejected under 35 U.S.C. 103(a) as being unpatentable over Finkelshtain et al. (US 2002/0083640A1) alone or in view of Amendola et al. (US 2002/0083643 A1) and further in view of evidentiary reference Pecsok (1953).

The present claims are broadly discussed hereinabove in the section ***Claims Analysis*** which is incorporated by reference and further in view of evidentiary reference Pecsok (1953).

The references '640 and Pecsok are discussed in the statement of rejection immediately hereinabove, which is incorporated here by reference. It is concluded that '640 either enables the ordinary artisan to immediately envisage the employment of, or to be motivated by suggestion to employ, the expedient of increasing the basicity to obtain a desired level of stability, and further to dilute such mixture to obtain the suggested 6M concentration in use. It is suggested to further employ methanol, a surface active compound, 0042, which is well known as an anti-freeze, as called for in claims 96, 97, 115, 116, and 130.

It would have been obvious to one of ordinary skill in the art at the time of the invention to "package" or "container" the obvious or anticipated storage stable concentrate along with a package or container containing the necessary solvent for obtaining the acknowledged optimal 6M fuel mixture and appropriate instructions because: (1) such avoids problems of dosing the proper amounts of the two components by the end user; (2) such avoids problems of dosing with impure solvent. Further, '643 suggests starting with a concentrated solution and adding water during

use ([0032] at the last 2-4 lines of page 2). The packages and containers forming a part of the claims are well known in the prior art and Applicant has not represented them as, per se, novel, accordingly Official notice is taken of these particulars. To the extent that the claims require a pH not suggested by the reference, '643 suggests that higher pH is more effective, paragraph 0033, and it is concluded that one of ordinary skill in the art at the time of the invention would have found it obvious to employ workable pH while keeping in mind the intention of diluting and the desired generating output, balancing the various factors.

Claims 70-83 and 132-134 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suda (US 2002/0015869A1) alone or in view of Amendola et al. (US 2002/0083643 A1).

The present claims are broadly discussed hereinabove in the section ***Claims Analysis*** which is incorporated by reference.

See example 1; 30 weight % KOH is thought to be about 7.5M, which is "about" 8M, and 2 weight % KBH4 is thought to be about 0.4M. '869 further suggests the hydride be used in the range of 0.1 to 50 weight % (paragraph 0050) "in consideration of the desired power generating capacity of the liquid fuel cell...." It would have been obvious to one of ordinary skill in the art at the time of the invention to follow the plain suggestion in '869 to vary the amounts of components, to have employed concentrations anywhere within the ranges suggested, and to have made less concentrated ones from more concentrated ones as an obvious expedient. To the

extent that the claims require a pH not suggested by the reference, '643 suggests that higher pH is more effective, paragraph 0033, as well as suggests starting with a concentrated solution and adding water during use ([0032] at the last 2-4 lines of page 2), thus it is concluded that one of ordinary skill in the art at the time of the invention would have found it obvious to employ workable pH while keeping in mind the intention of diluting and the desired generating output, balancing the various factors.

Claims 70-83 and 132-134 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Tsang (US 6818334B2) alone or in view of Amendola et al. (US 2002/0083643 A1).

The present claims are broadly discussed hereinabove in the section ***Claims Analysis*** which is incorporated by reference.

'334 discloses production of two solutions, one comprising metal boro-hydride, water, and hydroxide, the other comprising water, which are then combined thus diluting each and which then forms a mixture used as a fuel in a fuel cell (column 1, line 42 to column 2, line 34, column 3, line 54 to column 4, line 45).

In the event the reference is deemed to be of not sufficient specificity to sustain a conclusion of anticipation, then it is concluded that it would have been obvious to one of ordinary skill in the art at the time of the invention to have selected proportions of components within the limits disclosed to determine the workable limitations. To the extent that the claims require a pH not suggested by the reference, '643 suggests that higher pH is more effective, paragraph 0033, as well as suggests starting with a

concentrated solution and adding water during use ([0032] at the last 2-4 lines of page 2), thus it is concluded that one of ordinary skill in the art at the time of the invention would have found it obvious to employ workable pH while keeping in mind the intention of diluting and the desired generating output, balancing the various factors.

Claims 84-97, 99, 101-116, 119-130, and 135-139 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsang (US 6818334B2) or Tsang (EP 1369947A2) which are equivalent but have different effective publication dates, each alone or in view of Amendola et al. (US 2002/0083643 A1).

The present claims are broadly discussed hereinabove in the section ***Claims Analysis*** which is incorporated by reference.

The reference '334 is discussed in the statement of rejection immediately hereinabove, which is incorporated here by reference. It is concluded that '334 or '947 either enables the ordinary artisan to immediately envisage the employment of, or to be motivated by suggestion to employ, the expedient of increasing the basicity to obtain a desired level of stability, and further to dilute such mixture to obtain the suggested 6M concentration in use. It is suggested to further employ additives (column 4, lines 1-9; or [0020]) several of which are is well known as an anti-freeze, as called for in claims 96, 97, 115, 116, and 130.

It would have been obvious to one of ordinary skill in the art at the time of the invention to "package" or "container" the obvious or anticipated storage stable concentrate along with a package or container containing the necessary solvent for

obtaining the acknowledged optimal 6M fuel mixture and appropriate instructions because: (1) such avoids problems of dosing the proper amounts of the two components by the end user; (2) such avoids problems of dosing with impure solvent. The packages and containers forming a part of the claims are well known in the prior art and Applicant has not represented them as, per se, novel, accordingly Official notice is taken of these particulars. To the extent that the claims require a pH not suggested by the reference, '643 suggests that higher pH is more effective, paragraph 0033, as well as suggests starting with a concentrated solution and adding water during use ([0032] at the last 2-4 lines of page 2), thus it is concluded that one of ordinary skill in the art at the time of the invention would have found it obvious to employ workable pH while keeping in mind the intention of diluting and the desired generating output, balancing the various factors.

Claims 70-83 and 132-134 are rejected under 35 U.S.C. 102(a) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Tsang (EP 1369947A2) alone or in view of Amendola et al. (US 2002/0083643 A1).

The present claims are broadly discussed hereinabove in the section ***Claims Analysis*** which is incorporated by reference.

'947 discloses production of two solutions, one comprising metal boro-hydride, water, and hydroxide, the other comprising water, which are then combined thus diluting each and which then forms a mixture used as a fuel in a fuel cell ([0006-0011], [0018-0024]).

In the event the reference is deemed to be of not sufficient specificity to sustain a conclusion of anticipation, then it is concluded that it would have been obvious to one of ordinary skill in the art at the time of the invention to have selected proportions of components within the limits disclosed to determine the workable limitations. To the extent that the claims require a pH not suggested by the reference, '643 suggests that higher pH is more effective, paragraph 0033, as well as suggests starting with a concentrated solution and adding water during use ([0032] at the last 2-4 lines of page 2), thus it is concluded that one of ordinary skill in the art at the time of the invention would have found it obvious to employ workable pH while keeping in mind the intention of diluting and the desired generating output, balancing the various factors.

Citation of Pertinent Prior Art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Amendola (US 5948558A) is noted for its disclosure stabilized, concentrated mixtures where increased basicity is linked to greater stability (column 1, lines 61-65).

Response to Arguments

Applicant's response of 2006 September 29 has been considered.

The objection to claim 118 under 37 CFR 1.75(c) has been mooted by cancellation of this claim.

The objections to claims under 37 CFR 1.75(i) have been withdrawn.

The rejections of claims 75, 88-90, 108, 109, and 123 under 35 USC 112, first paragraph, have been maintained. Applicant argues that the context of the formula for the hydrides would lead one of ordinary skill in the art to conclude that a neutral specie was intended. This is thought to be fully responded to hereinabove, in the statement of rejection.

The rejection of claim 99 under 35 USC 112, second paragraph, has been overcome by amendments to said claim.

The rejection of claim 100 under 35 USC 112, second paragraph, has been mooted by cancellation of this claim.

Applicant's arguments (pages 24-5 of response) with respect to the rejection of the method claims 70-83 and 132-134 over '640 are not persuasive. Applicant incorporates in their entirety arguments made previously; accordingly the arguments set forth in the most recent Office action in response to said arguments are likewise incorporated in their entirety. Applicant argues (middle paragraph, page 24, and bridging paragraph, pages 24-5) that '640 fails to motivate one to prepare a composition of higher than 6M and dilute prior to use because one knows that 6M is strongly basic and "should, thus exhibit sufficient (long term) stability for storage purposes without the presence of any additional KOH (or any other alkaline compound)" and further that "it is not seen that there is any motivation to prepare a metal hydride fuel concentrate and combine it with a solvent for dilution as it is recited in the rejected claims." This is responded to as follows. Claims 132-134 are not limited to 6M, 7M, or any Molarity and thus are not encompassed by these arguments. As for claims 70-83, as pointed out in

the statement of rejection, the relationship between increased basicity and storage stability is well known; Applicant has not provided evidence that this relationship has been thought in the prior art to peak at 6M or at pH 14 or that it is adequate at 6M, therefore it is still concluded that one of ordinary skill in the art at the time of the invention would have know to employ as much hydroxide as required for the intended storage stability, and that dilution would be effective to obtain the desired electrical performance and physical properties. Applicant did not address the rejection based on the combination of '640 in view of '643 (paragraph bridging pages 13-4 of the Office action).

Applicant's arguments (pages 26-7 of the response) with respect to rejection of the article claims over '640 are not persuasive. Applicant incorporates in their entirety arguments made previously; accordingly the arguments set forth in the most recent Office action in response to said arguments are likewise incorporated in their entirety. Applicant argues that the fuel of '640 has a pH above 14 due to the hydroxide concentration of 6M and concludes "wherefore one of ordinary skill in the art would not have any concerns regarding the storage stability of this fuel." The response in the immediately preceding paragraph is thought to address Applicant's arguments.

Applicant's arguments (pages 27-9 of the response) with respect to rejection of the method claims over '869 alone or in view of '634 have not been found to be persuasive. Applicant incorporates in their entirety arguments made previously; accordingly the arguments set forth in the most recent Office action in response to said arguments are likewise incorporated in their entirety. Applicant argues that the

reference does not provide any motivation to prepare a concentrated fuel and then to dilute it. This is responded to as follows: '869 does provide motivation to prepare a range of mixtures in order to obtain the desired power generating capacity. Further, '643 suggests starting with a concentrated solution and adding water during use ([0032] at the last 2-4 lines of page 2). The motivation to dilute such mixtures in order to match needs with resources on hand is found in the long existing practice of creating concentrates for storage and transport and performing dilution at the use site.

Applicant's arguments (pages 30-31 of the response) with respect to rejection of the method claims over '334 alone or in view of '634 have not been found to be persuasive. Applicant has amended the claims to require the intended use as a fuel in a direct liquid fuel cell. Noting this, Applicant points out that '334 is directed to fuels for producing hydrogen (which hydrogen is then fed to a fuel cell). Applicant asserts (top of page 31) that '334 does not teach a fuel concentrate "for a direct liquid fuel cell, let alone to dilute this concentrate before use in order to prepare the actual fuel." In response is the following. Applicant fails to assert that the disclosed methods of '334 produce fuels that are unsuitable for direct liquid fuel cell. Applicant's claims are to processes of storing concentrate and diluent and then mixing, and contain statements of intended use, but do not include actually directing the so made fuel to a direct liquid fuel cell. Applicant's assessment of the state of the prior art (specification, second sentence in [0003]) is considered germane; the fuels for generation of hydrogen are substantially the same as the fuels for direct liquid fuel cells.

Applicant's arguments (pages 31-33 of the response) with respect to rejection of the article claims over '334 or '947 alone or in view of '634 have not been found to be persuasive. Applicant has amended the claims to require the intended use as a fuel in a direct liquid fuel cell. Noting this, Applicant points out that '334 is directed to fuels for producing hydrogen (which hydrogen is then fed to a fuel cell). Applicant asserts (first full paragraph of page 32) that the fuel mixtures of '334 or '937 are "not useful as such and is merely used to generate hydrogen for a hydrogen-base fuel cell." In response is the following. This is not a distinction from Applicant's claims, which similarly produce fuel mixtures that are "not useful as such" but have to be processed in a fuel cell. Applicant then discusses the requirements of types of fuel cells disclosed by '334 and '947. This is responded to as follows. These distinctions are not directed to claimed subject matter. Applicant fails to assert that the disclosed fuels of '334 or '947 are unsuitable for direct liquid fuel cell. Applicant's claims are to articles for storing concentrate and diluent and for mixing, and contain statements of intended use, but do not include a direct liquid fuel cell. Applicant's assessment of the state of the prior art (specification, second sentence in [0003]) is considered germane; the fuels for generation of hydrogen are substantially the same as the fuels for direct liquid fuel cells. Applicant notes that '334 or '947 disclose processes of generating electricity from the fuel would preferably be operated continuously, and thus alleges this would render a prepackaged amount of mixture virtually useless. In response is the following. Applicant's article claims do require the separate components be combined all at once; it appears they could be employed gradually by attaching to suitable means, i.e., as

disclosed in '334 or '947. The disclosure of '334 or '947 provide concentrate and diluent to obtain benefits therefrom that accrue from said separate storage. It is obvious to one of ordinary skill in the art that as soon as the components are mixed the benefits of storage stability are lost. Thus, the decision to operate continuously or batchwise, options normally considered obvious to the ordinary artisan in view of each other, is one of recognized compromises; on the one extreme one would be motivated to mix the smallest quantity at a time so long as adequate mixing could occur and the fuel cell could operation uniformly, while on the other extreme one would be motivated to mix an entire batch thus eliminating the metering as an expense.

Applicant's arguments (pages 33-34 of the response) with respect to rejection of the method claims over '947 alone or in view of '634 have not been found to be persuasive. Applicant correctly notes this rejection parallels the rejection over '334 alone or in view of '634, and properly adopts all comments from the discussion of that rejection. The response is similarly adopted from the parallel response hereinabove.

Allowable Subject Matter

Claims 98, 117, and 131 are allowable over the prior art.

The following is a statement of reasons for the indication of allowable subject matter:

None of the references considered disclose "aromatic or aliphatic amine" in combination with metal hydride based fuel cell fuels.

Citation of Pertinent Prior Art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Jensen, Erik H., "A Study on Sodium Borohydride," (Nyt Nordisk Forlag, Arnold Busck, Copenhagen, 1954), pp. 38-45 is cited to further show that degree of basicity is related to degree of stability.

Various product data sheets and brochure are cited to show that concentrated stabilized borohydride/hydroxide solutions were known at the time of the invention.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew A. Thexton whose telephone number is 571-272-1125. The examiner can normally be reached on Tuesday-Friday, 10:00-7:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasudevan S. Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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